Patent
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IN THE CLAIMS

The following is a replacement claim set.

1. (currently amended) A structurally supported tire, comprising:

a reinforced annular band comprising an elastomeric shear layer, at least a first membrane adhered to a radially inward extent of the elastomeric shear layer and at least a second membrane adhered to a radially outward extent of the elastomeric shear layer, wherein each of the membranes has a longitudinal tensile modulus greater than a shear modulus of the shear layer and wherein a ratio of the longitudinal tensile modulus of one or more of the membranes to the shear modulus of the shear layer is at least about 100:1;

a plurality of web spokes extending transversely across and radially inward from the reinforced annular band; and

means for interconnecting the plurality of web spokes with a wheel.

2. (original) The tire according to claim 1, further comprising a tread portion disposed on a radially outer extent of the reinforced annular band.

3. (original) The tire according to claim 1, wherein said means for interconnecting the plurality of web spokes with a wheel comprises a mounting band mutually interconnecting the radially inner ends of the web spokes.

4. (original) The tire according to claim 1, wherein said means for interconnecting the plurality of web spokes with a wheel comprises an enlarged end portion on each of said web spokes adapted to fit in an engaging slot in a wheel.

5. (original) The tire according to claim 1, wherein the plurality of web spokes further comprises a radially outer band mutually interconnecting radially outer ends of the web spokes.

6. (original) The tire according to claim 1, wherein each web spoke is oriented parallel to the axial direction.

7. (original) The tire according to claim 1, wherein each web spoke is oriented oblique to the axial direction.

8. (previously presented) The tire according to claim 7, wherein mutually adjacent web spokes are oriented at opposite oblique angles to the axial direction.

9. (original) The tire according to claim 1, wherein mutually adjacent web spokes are oriented at opposite oblique angles to the radial direction forming a zig-zag in the equatorial plane.

10. (original) The tire according to claim 1, wherein the plurality of web spokes are oriented in crossed pairs forming a repeating X-pattern in the equatorial plane.

11. (original) The tire according to claim 1, wherein the web spokes have a curvature in the equatorial plane to facilitate bending when under compression in the radial direction.

12. (original) The tire according to claim 1, wherein a first plurality of web spokes is oriented parallel to the axial direction and a second plurality of web spokes is oriented perpendicular to the axial direction.

13. (original) The tire according to claim 1, wherein each web spoke has a thickness that is not more than about 5% of a radius of the tire.

14. (cancelled)

15. (currently amended) The tire according to claim 1[[4]], wherein the ratio of the longitudinal tensile modulus of the one or more of the membranes to the shear modulus of the shear layer is at least about 1000:1.

16. (original) The tire according to claim 1, wherein a product of the shear modulus of elasticity of the shear layer times a radial thickness of the shear layer is approximately equal to a product of a tire ground contact pressure times a radial position of the outermost extent of the second membrane.

17. (original) The tire according to claim 1, wherein the elastomeric shear layer has a shear modulus of elasticity of about 3 MPa to about 20 MPa.

18. (original) The tire according to claim 1, wherein each of the at least first and second membranes comprise layers of essentially inextensible cord reinforcements embedded in an elastomeric coating layer having a shear modulus of elasticity at least equal to the shear modulus of elasticity of the shear layer.

19. (original) The tire according to claim 18, wherein the cord reinforcements of the first and second membranes form an angle with the tire circumferential direction of between about 10° and 45°.

20. (original) The tire according to claim 1, wherein the second membrane has an arcuate transverse profile having a transverse radius of curvature less than a transverse radius of curvature of a radially outermost surface of the tread portion.

21. (original) The tire according to claim 1 wherein the second membrane is undulated having an amplitude of undulation in the radial direction and a wavelength of undulation in the axial direction.

22. (currently amended) The tire according to claim 1, wherein the first and second membranes are formed of one of a homogeneous material, a fiber reinforced matrix, and a layer having discrete reinforcing elements.

23. (currently amended) A structurally supported wheel-tire, comprising:

a reinforced annular band comprising an elastomeric shear layer, at least a first membrane adhered to a radially inward extent of the elastomeric shear layer and at least a second membrane adhered to a radially outward extent of the elastomeric shear layer, wherein each of the membranes has a longitudinal tensile modulus greater than the shear modulus of the shear layer and wherein a ratio of the longitudinal tensile modulus of one or more of the membranes to the shear modulus of the shear layer is at least about 100:1;

a tread adhered to a radially outer extent of the reinforced annular band;

a plurality of web spokes extending substantially transversely across and radially inward from the reinforced annular band; and

a wheel radially inward of the plurality of web spokes and interconnected therewith.

24. (original) The wheel-tire according to claim 23, wherein the wheel and the plurality of web spokes are an integrally molded unit.

25. (original) The wheel-tire according to claim 23, wherein each of the plurality of web spokes is mechanically interconnected to the wheel.

26. (original) The wheel-tire according to claim 23, wherein the plurality of web spokes are interconnected by a mounting band which is adhered to the wheel.

27. (currently amended) A structurally supported tire, comprising:

a reinforced annular band comprising an elastomeric shear layer, at least a first reinforcement membrane adhered to a radially inward extent of the elastomeric shear layer and at least a second reinforcement membrane adhered to a radially outward extent of the elastomeric shear layer, wherein each of the membranes has a longitudinal tensile modulus greater than a shear modulus of the shear layer and wherein a ratio of the longitudinal tensile modulus of one or more of the membranes to the shear modulus of the shear layer is at least about 100:1; and

a plurality of web spokes extending transversely across and radially inward from the reinforced annular band and interconnecting with a surface of the reinforced annular band.

28. (previously presented) The tire according to claim 27, further comprising:

a mounting band mutually interconnecting the radially inner ends of the web spokes for mounting on a wheel.

29. (previously presented) The tire according to claim 27, further comprising:

an enlarged end portion on each of the web spokes adapted to fit in an engaging slot in the wheel for interconnecting the plurality of web spokes with a wheel.

30. (previously presented) The tire according to claim 27, wherein the plurality of web spokes further comprises a radially outer band mutually interconnecting radially outer ends of the web spokes to interconnect the web spokes with the surface of the reinforced annular band.

31. (cancelled)

32. (currently amended) The tire according to claim 27, wherein the ratio of the longitudinal tensile modulus of one or more of the membranes to the shear modulus of the shear layer is at least about 1000:1.

33. (previously presented) The tire according to claim 27, wherein a product of the shear modulus of elasticity of the shear layer times a radial thickness of the shear layer is approximately equal to a product of a tire ground contact pressure times a radial position of the outermost extent of the second membrane.